Annual Subject Index

ASTRONOMY 1988: VOLUME 16, NUMBERS 1-12

Ariel

Ice Volcanoes on Uranian Satellites, December 1988, 10.

Asteroids

The Chronology of Planetary Bombardments, Patricia Barnes-Svarney, July 1988, 20

The Day the Earth Caught Fire, December 1988, 10.

The Soviets Advance into the Solar System, Donald F. Robertson, July 1988, 36.

Astrology

High Noon for Astrology in 1991, October 1988, 18.

Astronomy - General

Amateurs as Professionals, Jacqueline Mitton, November 1988, 8.

Astronomers Converge on Victoria, October 1988, 16.

Astronomy Retail Show Draws Crowd, August 1988, 16.

Astronomy, Right When I Needed It, Susan E. Allen, October 1988, 104.

An Eclipse through the Eyes of a Child, Joseph T. Hepworth, February 1988, 26. Fighting Astrofiction with Facts in the

Media, Mike Brake, May 1988, 30.
The First Astronomy Novel, Kenneth Weitzenhoffer, June 1988, 28.

'Give Me a Break,' Sez Mr. Sun, Robert J. Nemiroff, October 1988, 104.

How to Plan a Successful Astronomy Day, October 1988, 18.

Is Stellar Astronomy a Second-Class Science?, Lys Ann Shore, October 1988, 50.

A Nation Hungry for Astronomy, Gary Sampson, December 1988, 8.

A Tall Tale of Telescope Making, Henry C. Gernhardt, Jr., February 1988, 24. U.S. Astronomy Losing Ground, Peter B.

Boyce, July 1988, 8. World Astronomers Convene in Baltimore,

Astronomy Clubs

November 1988, 12.

Astronomical League Gathers in Omaha, November 1988, 18.

ASTRONOMY's 1988 Summer Guide, May 1988, 60.

How to Plan a Successful Astronomy Day, October 1988, 18.

Los Angeles 31-Inch Sees First Light, September 1988, 18.

Mars Stars at Astrofest, December 1988, 16. Warm Nights, Winter Skies at Florida Star Party, July 1988, 16.

Astrophotography

Kodak Sponsors Australian Astrophoto Contest, August 1988, 16.

A New Dimension to Winter Sky Objects, David J. Eicher, November 1988, 94. The Real Lives of Ten Top Astrophotographers, Robert Reeves, March 1988, 24.

Astrophotography - Equipment

The Astrophotographer's Gadget Box, November 1988, 107.

Filters for Better Astrophotos, Rick Dilsizian, July 1988, 78.

High-Resolution Lunar and Planetary Photography, Rick Dilsizian, January 1988, 70.

Prime-Focus Photography with Small Telescopes, Andrew Packer, April 1988, 58. Tools for Prime-Focus Astrophotography,

David J. Eicher, April 1988, 62.
Tools for the Astrophotographer, Richard Talcott, January 1988, 78.

Astrophotography -- Film

The Revolution in Fast Film, November 1988, 100.

Astrophotography — Techniques

Conquering the Cepheus Nebula, Mace Hooley, June 1988, 71.

Do-It-Yourself Color Processing, Rick Dilsizian, September 1988, 84.

Filters for Better Astrophotos, Rick Dilsizian, July 1988, 78.

High-Resolution Lunar and Planetary Photography, Rick Dilsizian, January 1988, 70.

How to Make Great Astrophotos, Jack Newton, November 1988, 82. Make Your Own Black-and-White Prints,

Matthew F. Willson, March 1988, 70. Prime-Focus Photography with Small Telescopes, Andrew Packer, April 1988, 58.

Charon

Pluto Emerges from the Shadows, David J. Eicher, September 1988, 52.

Rocky Pluto Has Methane Crust, Charon Is Frosty, March 1988, 86.

Comet Bradfield

Comet Bradfield Dazzles Backyard Observers, David J. Eicher, February 1988, 34. Comet Bradfield Grows an Antitail, David J. Eicher, April 1988, 90.

Did Anyone Photograph This Comet?, July 1988, 16.

Comets

The Chronology of Planetary Bombardments, Patricia Barnes-Svarney, July 1988, 20.

Comets Levy and Shoemaker-Holt Related, September 1988, 10.

Is the Oort Cloud Pristine?, September 1988, 12.

Placid Oort Cloud Model Bashed Again, December 1988, 12.

Computer Programs

Galactic Collisions on Your Computer, Michael C. Schroeder and Neil F. Comins, December 1988, 90.

Cosmology

Cosmic Origins of the Elements, Gary Bennett, August 1988, 18.

Galaxies at the Confusion Limit, Jeff Kanipe, December 1988, 56.

Most Distant Object in Universe Discovered, June 1988, 89.

Mysterious Objects May Be Youngest Galaxies, April 1988, 74.

New Hubble Constant Reduces the Age of the Universe, November 1988, 14.

A New 'Yardstick' for the Universe, Gerrit L. Verschuur, November 1988, 60.

Old Galaxy, Young Universe September 1988, 10.

Our Cosmic Horizons — Part One: From the Cradle of Creation, Robert Scherrer, February 1988, 40.

Our Cosmic Horizons — Part Two: The Search for Dark Matter, Virginia Trimble, March 1988, 18.

Our Cosmic Horizons — Part Three: The Structure of the Visible Universe, Stephen A. Gregory, April 1988, 42.

Our Cosmic Horizons — Part Four: Recreating the Universe, Adrian L. Melott, May 1988, 42.

Planetary Nebulae Yield Distances to Galaxies, December 1988, 12.

Quest for the Most Distant Objects in the Universe, Jeff Kanipe, June 1988, 20.

Earth

The Day the Earth Caught Fire, December 1988, 10.

Noctilucent Clouds May Endanger Shuttle, December 1988, 16.

The Rise and Fall of the Sun's Activity, Jeff Kanipe, Richard Talcott, and Robert Burnham, October 1988, 22.

Solar Activity and Earth's Climate, August 1988, 10.

Eclipses

Confessions of an Eclipse Addict, Joel K. Harris, January 1988, 62.

Eclipse Tales from the South Pacific, July 1988, 66.

An Eclipse through the Eyes of a Child, Joseph T. Hepworth, February 1988, 26. The 1988 Eclipse from Space, August 1988,

Solar Eclipse Shows Magnificent Prominences, David J. Eicher, July 1988, 84.

Education

AAS Hosts Teachers' Workshop, May 1988, 87.

Astronomy in Our Schools, Stephen Cole, September 1988, 36.

Get Involved in Education, Andrew Fraknoi, September 1988, 8.

NASA Educational Resources Now Available by Mail, November 1988, 16.

A Nation Hungry for Astronomy, Gary Sampson, December 1988, 8. Private Observatory for Public Education,

Annual Subject Index

ASTRONOMY 1988: VOLUME 16, NUMBERS 1-12

Ariel

Ice Volcanoes on Uranian Satellites, December 1988, 10.

Asteroids

The Chronology of Planetary Bombardments, Patricia Barnes-Svarney, July 1988, 20

The Day the Earth Caught Fire, December 1988, 10.

The Soviets Advance into the Solar System, Donald F. Robertson, July 1988, 36.

Astrology

High Noon for Astrology in 1991, October 1988, 18.

Astronomy - General

Amateurs as Professionals, Jacqueline Mitton, November 1988, 8.

Astronomers Converge on Victoria, October 1988, 16.

Astronomy Retail Show Draws Crowd, August 1988, 16.

Astronomy, Right When I Needed It, Susan E. Allen, October 1988, 104.

An Eclipse through the Eyes of a Child, Joseph T. Hepworth, February 1988, 26. Fighting Astrofiction with Facts in the

Media, Mike Brake, May 1988, 30.
The First Astronomy Novel, Kenneth Weitzenhoffer, June 1988, 28.

'Give Me a Break,' Sez Mr. Sun, Robert J. Nemiroff, October 1988, 104.

How to Plan a Successful Astronomy Day, October 1988, 18.

Is Stellar Astronomy a Second-Class Science?, Lys Ann Shore, October 1988, 50.

A Nation Hungry for Astronomy, Gary Sampson, December 1988, 8.

A Tall Tale of Telescope Making, Henry C. Gernhardt, Jr., February 1988, 24. U.S. Astronomy Losing Ground, Peter B.

Boyce, July 1988, 8. World Astronomers Convene in Baltimore,

Astronomy Clubs

November 1988, 12.

Astronomical League Gathers in Omaha, November 1988, 18.

ASTRONOMY's 1988 Summer Guide, May 1988, 60.

How to Plan a Successful Astronomy Day, October 1988, 18.

Los Angeles 31-Inch Sees First Light, September 1988, 18.

Mars Stars at Astrofest, December 1988, 16. Warm Nights, Winter Skies at Florida Star Party, July 1988, 16.

Astrophotography

Kodak Sponsors Australian Astrophoto Contest, August 1988, 16.

A New Dimension to Winter Sky Objects, David J. Eicher, November 1988, 94. The Real Lives of Ten Top Astrophotographers, Robert Reeves, March 1988, 24.

Astrophotography - Equipment

The Astrophotographer's Gadget Box, November 1988, 107.

Filters for Better Astrophotos, Rick Dilsizian, July 1988, 78.

High-Resolution Lunar and Planetary Photography, Rick Dilsizian, January 1988, 70.

Prime-Focus Photography with Small Telescopes, Andrew Packer, April 1988, 58. Tools for Prime-Focus Astrophotography,

David J. Eicher, April 1988, 62.
Tools for the Astrophotographer, Richard Talcott, January 1988, 78.

Astrophotography -- Film

The Revolution in Fast Film, November 1988, 100.

Astrophotography — Techniques

Conquering the Cepheus Nebula, Mace Hooley, June 1988, 71.

Do-It-Yourself Color Processing, Rick Dilsizian, September 1988, 84.

Filters for Better Astrophotos, Rick Dilsizian, July 1988, 78.

High-Resolution Lunar and Planetary Photography, Rick Dilsizian, January 1988, 70.

How to Make Great Astrophotos, Jack Newton, November 1988, 82. Make Your Own Black-and-White Prints,

Matthew F. Willson, March 1988, 70. Prime-Focus Photography with Small Telescopes, Andrew Packer, April 1988, 58.

Charon

Pluto Emerges from the Shadows, David J. Eicher, September 1988, 52.

Rocky Pluto Has Methane Crust, Charon Is Frosty, March 1988, 86.

Comet Bradfield

Comet Bradfield Dazzles Backyard Observers, David J. Eicher, February 1988, 34. Comet Bradfield Grows an Antitail, David J. Eicher, April 1988, 90.

Did Anyone Photograph This Comet?, July 1988, 16.

Comets

The Chronology of Planetary Bombardments, Patricia Barnes-Svarney, July 1988, 20.

Comets Levy and Shoemaker-Holt Related, September 1988, 10.

Is the Oort Cloud Pristine?, September 1988, 12.

Placid Oort Cloud Model Bashed Again, December 1988, 12.

Computer Programs

Galactic Collisions on Your Computer, Michael C. Schroeder and Neil F. Comins, December 1988, 90.

Cosmology

Cosmic Origins of the Elements, Gary Bennett, August 1988, 18.

Galaxies at the Confusion Limit, Jeff Kanipe, December 1988, 56.

Most Distant Object in Universe Discovered, June 1988, 89.

Mysterious Objects May Be Youngest Galaxies, April 1988, 74.

New Hubble Constant Reduces the Age of the Universe, November 1988, 14.

A New 'Yardstick' for the Universe, Gerrit L. Verschuur, November 1988, 60.

Old Galaxy, Young Universe September 1988, 10.

Our Cosmic Horizons — Part One: From the Cradle of Creation, Robert Scherrer, February 1988, 40.

Our Cosmic Horizons — Part Two: The Search for Dark Matter, Virginia Trimble, March 1988, 18.

Our Cosmic Horizons — Part Three: The Structure of the Visible Universe, Stephen A. Gregory, April 1988, 42.

Our Cosmic Horizons — Part Four: Recreating the Universe, Adrian L. Melott, May 1988, 42.

Planetary Nebulae Yield Distances to Galaxies, December 1988, 12.

Quest for the Most Distant Objects in the Universe, Jeff Kanipe, June 1988, 20.

Earth

The Day the Earth Caught Fire, December 1988, 10.

Noctilucent Clouds May Endanger Shuttle, December 1988, 16.

The Rise and Fall of the Sun's Activity, Jeff Kanipe, Richard Talcott, and Robert Burnham, October 1988, 22.

Solar Activity and Earth's Climate, August 1988, 10.

Eclipses

Confessions of an Eclipse Addict, Joel K. Harris, January 1988, 62.

Eclipse Tales from the South Pacific, July 1988, 66.

An Eclipse through the Eyes of a Child, Joseph T. Hepworth, February 1988, 26. The 1988 Eclipse from Space, August 1988,

Solar Eclipse Shows Magnificent Prominences, David J. Eicher, July 1988, 84.

Education

AAS Hosts Teachers' Workshop, May 1988, 87.

Astronomy in Our Schools, Stephen Cole, September 1988, 36.

Get Involved in Education, Andrew Fraknoi, September 1988, 8.

NASA Educational Resources Now Available by Mail, November 1988, 16.

A Nation Hungry for Astronomy, Gary Sampson, December 1988, 8. Private Observatory for Public Education, December 1988, 18.

Share Your Universe with a Kid, Bobby King, September 1988, 99.

Space University Opens at MIT, Karen Hartley, October 1988, 14.

Equipment

Build a Binocular 'Sky Scanner,' Bryan P. Shumaker, February 1988, 64. Build ASTRONOMY's Star Time Clock,

Build ASTRONOMY's Star Time Clock, Irwin Sternberg, March 1988, 44. A Close-Up Look at Eyepieces, David J.

Eicher, October 1988, 82.

First Views through a Little Scope. Robert

W. McCune, July 1988, 90. The Mount of Gibraltar, Rick Shaffer,

August 1988, 64. Ready, Compute, Aim, Bill Burton, July 1988, 71.

Soup Up Your Small Scope, Rick Shaffer, September 1988, 80.

A Telescope for Kids, Peter Ceravolo, June 1988, 79.

Galaxies

Anatomy of a Cosmic Jet, Jeff Kanipe, July 1988, 30.

Details in M31's Bulge, June 1988, 92. Faint Ripples Shed Light on Galaxy Evolution, April 1988, 75.

Galactic Collisions on Your Computer, Michael C. Schroeder and Neil F. Comins, December 1988, 90.

Galaxies at the Confusion Limit, Jeff Kanipe, December 1988, 56.

Hot Gas Flowing from Active Galaxy, January 1988, 89.

How Do Galaxies Form Shells?, January 1988, 89.

Is Stellar Astronomy a Second-Class Science?, Lys Ann Shore, October 1988, 50.

Is the Milky Way an Interacting Galaxy?, Gerrit L. Verschuur, January 1988, 26. Mysterious Objects May Be Youngest Galaxies, April 1988, 74.

New Hubble Constant Reduces the Age of the Universe, November 1988, 14. A New Most-Distant Galaxy Sighted,

November 1988, 10. Old Galaxy, Young Universe, September 1988, 10.

Our Cosmic Horizons — Part One: From the Cradle of Creation, Robert Scherrer, February 1988, 40.

Our Cosmic Horizons ← Part Two: The Search for Dark Matter, Virginia Trimble, March 1988, 18.

Our Cosmic Horizons — Part Three: The Structure of the Visible Universe, Stephen A. Gregory, April 1988, 42.

Our Cosmic Horizons — Part Four: Recreating the Universe, Adrian L. Melott, May 1988, 42.

Planetary Nebulae Yield Distances to Galaxies, December 1988, 12.

Quasars Triggered by Galactic Collisions, May 1988, 84. Starburst Era Identified in Distant Galaxy,

July 1988, 10. Theory of Galaxy Formation Altered, May 1988, 85.

Galileo

Galileo Mission to Jupiter Is Still On, March 1988, 86.

Gravity Lenses

Luminous Arcs Caused by Gravitational Lensing, April 1988, 72. 'Multiple Quasar' Produced by Gravitational Lens. November 1988, 12.

A New 'Yardstick' for the Universe, Gerrit L. Verschuur, November 1988, 60.

Herschel, William

William Herschel: Pioneer of the Stars, Brian Jones, November 1988, 40.

History

The First Astronomy Novel, Kenneth Weitzenhoffer, June 1988, 28.

The Mystery Stars in Sagittarius, Morton Wagman, July 1988, 91.

Pioneering Astronomy at Lick Observatory, John R. Gustafson, May 1988, 6. Thinking Galaxies in 1775, John Mood, February 1988, 28.

William Herschel: Pioneer of the Stars, Brian Iones, November 1988, 40.

Hubble Space Telescope

The Space Telescope Comes to Life, Stephen Cole, October 1988, 42.

Interstellar Medium

The Chaotic Material between the Stars, Lys Ann Shore and Steven N. Shore, June

The Stickiness of Interstellar Dust, October 1988, 12.

lo

Jupiter's Moon lo Shows Thicker Sodium Atmosphere, October 1988, 12.

lets

Anatomy of a Cosmic Jet, Jeff Kanipe, July 1988, 30.

Jupiter

Galileo Mission to Jupiter Is Still On, March 1988, 86.

The Great Red Spot Comes to Earth, June 1988, 88.

Jupiter Shows Increased Activity, January 1988, 87.

Light Pollution

Beating Light Pollution with 'Good Light,' August 1988, 10.

IAU Studies Hazards to Astronomy, November 1988, 14.

Shielding the Night Sky, Bob Goff and Tim B. Hunter, September 1988, 47.

Mars

Celebrating Mars This Fall, September 1988, 16.

Digging Deeper for Life on Mars, Michael Carroll, April 1988, 6. Dust Storms Observed on Mars, David J.

Eicher, September 1988, 90. Forecast for Dust Storms on Mars, Jeff



TRAVEL THROUGH THE UNIVERSE WITH UNITRON

Designed to the highest optical standards. Unitron refractor telescopes and accessories combine diffraction-limited optics with expert mechanical craftsmanship. The results are superior resolution per inch of aperture, unparalleled performance even under inferior viewing conditions, and optimal definition along an unobstructed light path. All of Unitron's telescopes are backed by a full 25 year warranty. For our complete catalog of telescopes, spotting scopes, binoculars, and other fine optical instruments send in coupon below.

EXCELLENCE BY DESIGN

	SINCE 1952	
	Unitron's catalog or postage and handling	
UNITRON, INC. 175 Express Str Plainview, N.Y. Tel. (516) 822-4	11803, U.S.A.	
Name		
Address		
City	State Zip	

Kanipe, August 1988. 76.

High Marks for Soviet Mars Mission, July 1988, 12.

Mars' Opening Act, David J. Eicher, December 1988, 76

Mars Stars at Astrofest, December 1988, 16.

Martian Ballooning in Lithuania, December 1988, 16.

1988: A Great Year for Mars, Jeff Beish and Donald Parker, March 1988, 58.

Soviet Mission Carries U.S. Commemorative Plaque, August 1988, 14.

Soviet *Phobos* Mission En Route to Mars, October 1988, 16.

The Soviets Advance into the Solar System, Donald F. Robertson, July 1988, 36. Space Writer Robert M. Powers: Dreaming

of Mankind's Life on Mars, A. J. Austin, April 1988, 24. Ten Pointers for Mars Observers, July 1988,

76. Yellow Dust Clouds on Mars. David I.

Eicher, November 1988, 114.

Mercury

Mercury's Heart of Iron, Clark R. Chapman, November 1988, 22.

Dark Skies for the Perseid Meteor Shower.

Meteor Showers

Philip Bagnall, August 1988, 78.
Perseids Produce Bright Fireballs, David J. Eicher, December 1988, 108.
Silver Meteors on a Lavender Sky, Bryon Lawrence. September 1988, 98.

Milky Way

Is the Milky Way an Interacting Galaxy?, Gerrit L. Verschuur, January 1988, 26.

Miranda

Ice Volcanoes on Uranian Satellites, December 1988, 10. Internal Ice Key to Miranda's Surface?, February 1988, 80.

Moon

Charting Mountains on the Moon, Michael T. Kitt, August 1988, 71. Looking for Lunar Fractures, Michael T. Kitt, February 1988, 56.

One Day at Copernicus Crater, Michael T. Kitt, September 1988, 70.

Reaching for the Moon, Donald F. Robertson, August 1988, 12.

Neptune

Neptunian Moon Victim of Cometary Impact?, October 1988, 12. Voyager's First Glimpse of Neptune, Richard Berry, October 1988, 46.

Nereid

Neptunian Moon Victim of Cometary Impact?, October 1988, 12.

Novae

The Mystery of Nova Cygni Solved, June 1988, 91.

Observatories

ASTRONOMY's 1988 Summer Guide, May

1988. 60.

Private Observatory for Public Education, December 1988, 18.

Observatories - Keck

The Telescope That Defies Gravity, Richard Berry, July 1988, 42.

Observatories - Lick

Lick Refurbishes 36-Inch Lens and Dome, August 1988, 12.

Pioneering Astronomy at Lick Observatory, John R. Gustafson, May 1988, 6.

Observatories - McDonald

See the Sky through a 107-Inch Telescope, August 1988, 16.

Observatories - Mount Wilson

100-Inch Mount Wilson Telescope to Reopen, January 1988, 86. Renaissance on Mount Wilson, Richard Berry, April 1988, 18.

Observatories — Palomar

Palomar Observatory Fights the Heat, Tom Wilson, March 1988, 89.

Observatories - U.S. Naval

U.S. Naval Observatory Battles Urban Sprawl, March 1988, 43.

Observing - Deep Sky

Canis Major's Twenty-Six Star Clusters, February 1988, 90.

Galaxies in the Great Bear, David J. Eicher, April 1988, 94.

A Golden Opportunity for Globular Clusters, David J. Eicher, June 1988, 102. Messier Marathon Open to Northeasterners,

March 1988, 90.

A New Dimension to Winter Sky Objects,

David J. Eicher, November 1988, 94.

Observing Planetaries in the Winter Hexa-

gon, David J. Eicher, March 1988, 94. Orion's Great Nebula, January 1988, 102.

A Slew of Springtime Stars, David J. Eicher, May 1988, 94.

Southern Clusters of All Ages, Gregg D. Thompson, September 1988, 75. Warning: Globular Clusters Can Change

Your Life, David J. Eicher, April 1988, 82. Winning the Messier Marathon, Tom Lorenzin, November 1988, 120.

Observing - General

Astrocamping at the 'City of Rocks,' John Bushby, June 1988, 30.

ASTRONOMY's 1988 Summer Guide, May 1988, 60.

Be Prepared for Snap Decisions, George Henry Sprague, Jr., August 1988, 90. Confessions of an Eclipse Addict, Joel K. Harris, January 1988, 62.

Dark Skies for the Perseid Meteor Shower, Philip Bagnall, August 1988, 78.

Debunking Astronomical UFOs, lan Ridpath, December 1988, 114. Eclipse Tales from the South Pacific, July

1988, 66. First Views through a Little Scope, Robert W. McCune, July 1988, 90.

How I Learned to Coexist with Trees, Michael Masters, May 1988, 32.

It Was Just One of Those Nights, Doug Newman, March 1988, 32. The Joys of Rural Stargazing, Gary A. Wil-

liams, May 1988, 28. New Mexico Inn Caters to Astronomy Buffs,

December 1988, 18. Observe the Naked-Eye Sky Glows, Philip

Observe the Naked-Eye Sky Glows, Philip M. Bagnall, June 1988, 46.

Optical Illusions of Low-Angle Observing, Leendert de Witte, December 1988, 82. Record Year for Texas Star Party, August 1988, 14

The Red and Green Flashing Star, Beverly Mosier, August 1988, 91.

Searching for Supernovae, Jeff Kanipe, June 1988, 62.

Should You Keep an Astronomical Notebook?, Andrew M. Thorpe, January 1988,

Silver Meteors on a Lavender Sky, Bryon Lawrence, September 1988, 98.

Solar Eclipse Shows Magnificent Prominences, David J. Eicher, July 1988, 84. The Soviets Will Be Passing over Your

Town, June 1988, 93.
Stargazing from 35,000 Feet, Steven A.

Oetzell, April 1988, 28.
Try Some Backyard Science, July 1988, 14.

Observing - Moon

Charting Mountains on the Moon, Michael T. Kitt, August 1988, 71.

Looking for Lunar Fractures, Michael T. Kitt, February 1988, 56.

One Day at Copernicus Crater, Michael T. Kitt, September 1988, 70.

Observing -- Planets

Ashen Light on Venus, David J. Eicher, August 1988, 86.

Celebrating Mars This Fall, September 1988, 16.

Dust Storms Observed on Mars, David J. Eicher, September 1988, 90.

Forecast for Dust Storms on Mars, Jeff Kanipe, August 1988, 76.

Jupiter Shows Increased Activity, January 1988, 87.

Mars' Opening Act, David J. Eicher, December 1988, 76.

Marswatch '88, January 1988, 89. 1988: A Great Year for Mars, Jeff Beish and Donald Parker, March 1988, 58.

The Saturn-Uranus Triple Conjunction, Richard Talcott, April 1988, 66.
Ten Pointers for Mars Observers, July 198

Ten Pointers for Mars Observers, July 1988, 76.

Try Some Backyard Science, July 1988, 14. Yellow Dust Clouds on Mars, David J. Eicher, November 1988, 114.

Observing — Stars

Seeing Double, Phil Harrington, June 1988, 98.

Observing — Sun

Solar Activity on the Rise, David J. Eicher, October 1988, 99.

Phohos

High Marks for Soviet Mars Mission, July 1988. 12.

Soviet Mission Carries U.S. Commemorative Plaque, August 1988, 14.

Soviet Phobos Mission En Route to Mars. October 1988, 16,

Planetariums

ASTRONOMY's 1988 Summer Guide, May 1988. 60.

Planetary Nebulae

Planetary Nebulae Yield Distances to Galaxies, December 1988, 12.

Planets

The Chronology of Planetary Bombardments, Patricia Barnes-Svarney, July 1988,

Does Barnard's Star Have Planets?, Ken Croswell, March 1988, 6.

Otherworldly Visions, Thomas L. Hunt, December 1988, 44.

The Pull of Planet X, Ken Croswell, August 1988. 30.

Sunlike Star Has Planets?, November 1988, 10.

Pluto

Occultation Reveals Plutonian Atmosphere, October 1988, 10.

Pluto Emerges from the Shadows, David J. Eicher, September 1988, 52.

Rocky Pluto Has Methane Crust, Charon Is Frosty, March 1988, 86.

Powers, Robert M.

Space Writer Robert M. Powers: Dreaming of Mankind's Life on Mars, A. J. Austin, April 1988, 24.

Pulsars

On the Trail of Exotic Pulsars, Gerrit L. Verschuur, December 1988, 22.

Quasars

4.11-Redshifted Quasar Most Distant Object, January 1988, 88.

Most Distant Object in Universe Discovered, June 1988, 89.

'Multiple Quasar' Produced by Gravitational Lens, November 1988, 12.

Quasars Triggered by Galactic Collisions, May 1988, 84.

Quest for the Most Distant Objects in the Universe, Jeff Kanipe, June 1988, 20.

Radio Astronomy

Anatomy of a Cosmic Jet, Jeff Kanipe, July 1988, 30,

IAU Studies Hazards to Astronomy, November 1988, 14.

Is the Milky Way an Interacting Galaxy?, Gerrit L. Verschuur, January 1988, 26.

Radio Astronomy Looks to Space, Kurt W. Weiler, Brian K. Dennison, and Kenneth J. Johnston, May 1988, 18.

Reviews - Atlases/Guides

Discover the Stars, Robert A. Garfinkle,

August 1988, 94.

Meteor Showers: A Descriptive Catalog, Gail O. Clark, November 1988, 127 The Monthly Sky Guide, Robert A. Gar-

finkle, November 1988, 124.

The Peterson First Guide to Astronomy, Jeff Kanipe, September 1988, 103.

Uranometria 2000.0, volume I: The Northern Hemisphere to -6°. Dick Suiter and Brian Skiff, February 1988, 72.

Reviews — Equipment

Collimating Tools, Richard Berry, June 1988, 42

Hypered SR-V 3200, Richard Berry, June 1988. 43

Meade 2080 LX/6 and 2120 LX/6 Schmidt Cassegrain Telescopes, David I. Eicher, October 1988, 113.

The Pretoria Eyepiece, Robert Bunge, October 1988, 113,

SureSharp Astrophotography Focusing Device, Richard Berry, June 1988, 42.

Reviews — Fiction

First Light, Richard and Eleanor Berry, April 1988, 34.

Reviews - Nonfiction

Astrophotography II, Robert Burnham, April 1988. 36.

A Brief History of Time: From the Big Bang to Black Holes, Jeff Kanipe, August 1988,

Coon Mountain Controversies, Robert Burnham, June 1988, 38.

The Dance in the Sky: Native American Star Myths, Mark Hollabaugh, December 1988, 117

Exploring the Southern Sky, Robert Burnham, September 1988, 102.

Eye on the Sky: Lick Observatory's First Century, James S. Sweitzer, October 1988, 108.

First Light: The Search for the Edge of the Universe, Richard and Eleanor Berry, April 1988, 34,

Light from the Depths of Time, Robert Burnham, January 1988, 42.

Mercury: The Elusive Planet, Robert Burnham, November 1988, 122.

Meteorite Craters, Gail O. Clark, January 1988, 42,

The OMNI Space Almanac, Robert Burnharn, July 1988, 94.

Quasars, Redshifts, and Controversies, David S. Evans, December 1988, 116. The Space-Age Solar System, Robert Garfinkle, June 1988, 44.

Uranus and Neptune: The Distant Planets, Robert Burnham, October 1988, 109.

Who Got Einstein's Office?, Robert A. Garfinkle. November 1988, 126.

Reviews — Products

Astrogoggles, Robert Burnham, December 1988, 120.

Formula MC, Richard Berry, June 1988, 43. Greetings from Somewhere in the Solar System, Robert Burnham, August 1988,

Photo-Clear Lens Cleaner, Richard Berry,



12×50B



a full line: Porro Prism Binoculars Root Prism Binoculars Wide Angle Binoculars Military Binoculars

From Germanyaus JENA

in BRILLIANCE & CLARITY!

The world's finest in sporting optics is now available from Europe's largest manufacturer of premium quality on

Europtik, Ltd PO Box 319 Dunmore, PA 18509 (717) 347-6049

Dealer Inquiries Invited

KSTRONOMICAL T-SHIRTS! ACCURATE ! MACHINE-WASH ORION, HORSEHEAD, ROSETTE HELL X NEBULE WHIRLPOOL, ANDROMEDA GALAXIES, EARTH, HALLEY C. INDIVIDUALLY * HAND *

PAINTED* (AIRBRUSHED)

ON TOP- QUALITY BLACK SHIRT? (5-XL)\$20, (XXL)\$22 \$3 ship SWEATSHIRTS(5-XL)\$30. &handle custom shirts avail.,\$30+up. ALSO, 36-CHP NEUDADS, FARRINGS,
NEWAGE CUMON JEWELRY, STRINGO
ATAS, ETC., ET AL., + JORGE TO
CATALOG A; CATALOG A; CATALOG
THE CRYSTAL CONNECTION .

THE NEW HAVENS CT. 06511





MORNING STAR ASTRONOMICS

127 W. WASHINGTON MARION, OHIO 43302 (614) 383-3063

DEALERS OF:



Meade

INDEX CARD FINDER CHARTS

75 - 3 × 5 charts per set. For use at the telescope!

73 - 3 × 5 charts per set. For use at the telescope!
AC-1 MESSIER OBJECTS: AC-2 FINEST MCG OBJECTS:
AC-3 ODUBLE STARS: AC-2 FINEST MCG, part 8
AC-5 NGC FOR LARGER TELESCOPES (Min. 4 - inch)
57 50, 2 or more sets \$7 ea. 4 or more \$5.50 ea.
OBSERVER'S QUIDE A bi-monthly telescope guide. With Index charts, photos & visual descriptions. USA \$12, 2 yr.
527, Canada \$16, OTHER COUNTRIES \$16.
09SERVER'S LOGBOOK with 100 forms
\$18.95

VIDEO TAPES (VAS or BETA) "(VAS/PAL) \$29.95 sa.
"AMERICA IN SPACE, "APOLLO 11, "JUPITER/SATURN.
"MARS, URANUS, "UNIVERSE, "SHUTTLE 1 to 8, "SATEL-LITE RESCUE, COMET MALLEY, STS-1.

TAPE PROGRAMS with 40 slides — \$14.95 ea. APOLLO 11 APOLLO 17. COMET HALLEY, JUPITER, MARS - Viking, SAT URN - Voy. 1, SATURN - Voy 2, STS - 1, STS - 2, UNIVERSE MT. ST HELENS, DIXON SPACE ART, BONESTELL'S SPACE ART, GENESIA.

SPACE SPECIAL Galaxies, Solar System 100 slides \$32 95 20 SLIDE SETS. Mercury, Venus. Mers, Jupiter - Voyager 1, Jup. Voy. 2, Saturn - Voyager 1, Sat. - Voy. 2, STS - 1, BEST STS. APOLLO11, COMET HALLEY, Uranus, Universe. \$9.50 ***s. set.

ASTRO CARDS Phone 412-295-4128 P.O. Box 35, Natrona Heights, PA 15065

June 1988, 43.

Reviews - Slides

Eight Slide Sets from the ASP, Jeff Kanipe, July 1988, 95.

Stones, Wind, and Ice, Robert Burnham, December 1988, 120.

Volcanoes on Mars, Robert Burnham, December 1988, 121

Reviews - Software

Apollo 18: Mission to the Moon, James Bailey, November 1988, 129.

Astro-Finder, Michael Krochmal, March 1988, 36.

AstroSoft Computerized Ephemeris, Michael Krochmal, March 1988, 37.

Celestial Basic, Lawrence Paul, March 1988, 37.

Deep Space, Richard Berry, March 1988, 40.

Deep-Sky Object Inventory, Michael Krochmal, March 1988, 39.

Galileo, James Bailey, March 1988, 40. LodeStar, Michael Krochmal, March 1988, 41.

P.C. Planetarium, Michael Krochmal, March 1988, 41.

The Sky, Michael Krochmal, March 1988, 42.

Sky Travel, Lawrence Paul, March 1988, 42.

Space MAX, James Bailey, May 1988, 79. SUPERSTAR V2, Michael Krochmal, March 1988, 42.

TellStar II, Michael Krochmal, March 1988,

Reviews — Videotapes

Mars, The Red Planet, Jeff Kanipe, May 1988, 79.

Planets of Gas, Jeff Kanipe, May 1988, 79. Schmidt-Cassegrain Telescope Astro Video Tapes, Donald Trombino, May 1988, 76.

Satellites

The 1988 Eclipse from Space, August 1988, 26.

Radio Astronomy Looks to Space, Kurt W. Weiler, Brian K. Dennison, and Kenneth J. Johnston, May 1988, 18.

Will Solar Max Be Saved?, Gerrit L. Verschuur, October 1988, 34.

Saturn

The Saturn-Uranus Triple Conjunction, Richard Talcott, April 1988, 66.

Space

British Veto Freezes ESA Budget, September 1988, 14.

Build a Better Space Station, Thomas J. Frieling, October 1988, 8.

The Bush/Dukakis Space Race, Thomas J. Frieling, November 1988, 16.
Eighth Annual Spaceweek Events Held July

16-24, July 1988, 14.

Europe Launches Its Biggest Rocket, October 1988, 16.

Manned Exploration, Private Launch Industry Goals of New Space Policy, June 1988, 88

New Space Exploration Magazine Launched, August 1988, 14.

Reshaping the Public Attitudes toward the Space Program, David S. F. Portree, June 1988, 32.

Space Not a Priority for Presidential Candidates, Bruce Japsen and R. Scott Teets, May 1988, 85.

Space Art

Otherworldly Visions, Thomas L. Hunt, December 1988, 44.

Space Missions

ASTRONOMY Reader Poll Results: Shaping America's Future in Space, Kristine R. Majdacic, May 1988, 16.

Creating the Future, Stephen Cole and Kristine R. Majdacic, January 1988, 18.

Digging Deeper for Life on Mars, Michael Carroll, April 1988, 6.

Five Years beyond the Planets, October 1988, 16.

Galileo Mission to Jupiter Is Still On, March 1988, 86.

Great Observatory #3 Begins, December 1988, 14.

High Marks for Soviet Mars Mission, July 1988, 12.

Leadership and America's Future in Space, Sally K. Ride, January 1988, 8. NASA's Future: Growing, Shrinking, or

Status Quo?, September 1988, 16. NASA's Space Science Strategy, August 1988, 8.

Orbiting 'Super Observatory' Proposed by Soviet Union, November 1988, 16.

Planning for the Future: NASA's New Office of Exploration, Stephen Cole, January 1988. 32.

Radio Astronomy Looks to Space, Kurt W. Weiler, Brian K. Dennison, and Kenneth I. Johnston. May 1988, 18.

J. Johnston, May 1988, 18.Reaching for the Moon, Donald F. Robertson, August 1988, 12.

Reader Poll: Deciding the Future, January 1988, 23.

The Soviets Advance into the Solar System, Donald F. Robertson, July 1988, 36.

Soviet Mission Carries U.S. Commemorative Plaque, August 1988, 14.

Soviet *Phobos* Mission En Route to Mars, October 1988, 16. The Triumphant Grand Tour of *Voyager 2*,

Mark Littmann, December 1988, 34. Will Solar Max Be Saved?, Gerrit L. Verschuur, October 1988, 34.

Space Shuttle

Crew Escape System Ready for Shuttle, August 1988, 12.

Noctifucent Clouds May Endanger Shuttle, December 1988, 16.

Star Parties

Amateurs Gather at Stellafane, November 1988, 18.

Big Crowd at 20th Riverside Telescope Conference, September 1988, 18. Mars Stars at Astrofest, December 1988, 16. Record Year for Texas Star Party, August 1988, 14.

Warm Nights, Winter Skies at Florida Star Party, July 1988, 16.

Stars

Beta Pictoris Disk Is Bigger, Asymmetric, February 1988, 75

Brown Dwarf Orbits Nearby Star, February 1988, 78.

Close Binary Stars and Planetary Nebulae, September 1988, 10.

Cosmic Origins of the Elements, Gary Bennett, August 1988, 18.

The Difficult Birth of Sunlike Stars, Steven Stahler and Neil Comins, September 1988, 22.

Does Barnard's Star Have Planets?, Ken Croswell, March 1988, 6.

Explanation Offered for Outcast Open Clusters, June 1988, 91.

Insight into Star Death, Richard Talcott, February 1988, 6.

Is Stellar Astronomy a Second-Class Science?, Lys Ann Shore, October 1988, 50.

Massive 'Star' Found to Be Cluster, October 1988, 14.

The Mystery of Nova Cygni Solved, June 1988, 91.

The Mystery Stars in Sagittarius, Morton Wagman, July 1988, 91.

On The Trail of Exotic Pulsars, Gerrit L. Verschuur, December 1988, 22. Seeing Double, Phil Harrington, June 1988,

98. Sunlike Star Has Planets?, November 1988,

 Supernova Is Most Distant Star Ever Seen, December 1988, 10.

Thinking Telescopes, Richard Berry, August 1988, 42.

William Herschel: Pioneer of the Stars, Brian Jones, November 1988, 40.

Sun

Give Me a Break,' Sez Mr. Sun, Robert J. Nemiroff, October 1988, 104.

The Rise and Fall of the Sun's Activity, Jeff Kanipe, Richard Talcott, and Robert Burnham, October 1988, 22.

Solar Activity and Earth's Climate, August 1988, 10.

Solar Activity on the Rise, David J. Eicher, October 1988, 99.

Will Solar Max Be Saved?, Gerrit L. Verschuur, October 1988, 34.

Supernovae

Complete Rings of Light Encircle Supernova 1987A, November 1988, 12.

Echoes of the Supernova Explosion, July 1988, 10. Gamma Rays from Supernovae 1987A

Emerge, April 1988, 74. Insight into Star Death, Richard Talcott,

February 1988, 6. Searching for Supernovae, Jeff Kanipe, June 1988, 62.

Supernova Is Most Distant Star Ever Seen, December 1988, 10.

Telescopes — Amateur

ASTRONOMY's 1988 Guide to Telescopes, October 1988, 74.

Big Crowd at 20th Riverside Telescope Conference, September 1988, 18,

Los Angeles 31-Inch Sees First Light, September 1988, 18.

The Lure of a Big Scope, Tom Clark, October 1988, 76.

The Mount of Gibraltar, Rick Shaffer, . August 1988, 64.

1988 Telescope Buyers' Guide, October 1988 88

Ready, Compute, Aim, Bill Burton, July 1988, 71,

Soup Up Your Small Scope, Rick Shaffer, September 1988, 80.

A Telescope for Kids, Peter Ceravolo, June 1988. 79

Telescopes — Professional

Biggest Spin-Cast Mirror Produced in Arizona, October 1988, 10.

4.2-Meter Herschel Telescope Now Open. February 1988, 79.

Lick Refurbishes 36-Inch Lens and Dome, August 1988, 12.

New Technology Telescope Nears Completion, July 1988, 12.

New Telescope Discovers Extragalactic Molecule, Ian Ridpath, March 1988, 91. 100-Inch Mount Wilson Telescope to

Reopen, January 1988, 86. Renaissance on Mount Wilson, Richard Berry, April 1988, 18.

See the Sky through a 107-Inch Telescope, August 1988, 16.

The Telescope That Defies Gravity, Richard Berry, July 1988, 42.

Thinking Telescopes, Richard Berry, August 1988, 42, U.S. Astronomy Losing Ground, Peter B.

Boyce, July 1988, 8.

UFOs

Debunking Astronomical UFOs, Ian Ridpath, December 1988, 114.

Uranus

Ice Volcanoes on Uranian Satellites, December 1988, 10.

Internal Ice Key to Miranda's Surface?, February 1988, 80. New Uranian Satellite Names Adopted,

November 1988, 14. The Saturn-Uranus Triple Conjunction, Richard Talcott, April 1988, 66.

Venus

Ashen Light on Venus, David I. Eicher, August 1988, 86.

Voyager

The Triumphant Grand Tour of Voyager 2, Mark Littmann, December 1988, 34. Voyager's First Glimpse of Neptune, Richard Berry, October 1988, 46.

Celestron Savings for the Holidays

\$449



Celestron C4.5 Reflector

The C4.5 gives you features normally found only on big scopes, at a low price! Like Polaris mount, fully multicoated mirrors, and rack and pinion focuser. Includes full size 25mm, 1.25" orthoscopic eyepiece, 5x24 finderscope, and hardwood tripod.

New Celestron Ultima 8

With built-in drive corrector, rechargeable battery, and extra heavy-duty wedge and tripod.

New! Celestron 60mm Refractor

This 80mm f/13 telescope is ideal for the young astronomer. Complete with German equatorial mount, setting circles, 25mm, .965 eyepiece, finderscope, and full standing wood tripod.

Additional eyepieces . Optional visual filters

Celestron SP-C8 with Starbright®

\$1079 2000mm f/10 Schmidt-Cassegrain with Super Polaris

HOLIDAY SPECIAL!

Celestron Comet Catcher . . . \$419 with tripod & fluid head \$489



Celestron Binoculars

An excellent addition to any astronomer's equ ment, these fully multi-coated glasses feature BAK-4 prisms. Their sharpness, brightness, and extended field of view add up to a great value! Choose from.

7x42 Ultima, 22 oz, 6.6° field 7x50 Nova, 40 oz, 10° field 10x50 Nova, 40 oz, 8° field

Celestron Accessories

Powerstar Declination Motor	\$99
Powerstar Focus Motor	\$99
Powerstar Car Battery Cord	.\$15
8" Counterweight Set	.\$49
Counterweight bar assembly	.\$99
Super Polaris Drive (single axis)	\$159
Super Polaris Drive (dual axis)	\$259
Quartz dual-axis corrector system	\$229
illuminated projection reticle	\$149
Richfield adapter	
tangent assembly	\$299
Basic C-90	\$399



New Celestron Powerstar III

\$1499

The best complete visual and photographic tele-scope package! Unsurpassed Starbright optics are hand-matched, laser tested, and certified to give you the best image possible in a Schmidt-Cassegrain telescope. Plus outstanding Byers drive system and many convenient features make the Powerstar III the ideal telescope to discover Mars and much, much more! Includes hand control, wedge, tripod, and Celestron's tough new case. Order now and get a free T-adapter, tele extender, Dewstar shade, and sky

New Celestron Classic 8

\$999

\$3495

Celestron Compustar 8

Tele Vue Eyepieces

New Low Prices!
Plossl 7.4mm, 10.5mm, 13mm,
17mm, 21mm, or 26mm\$67
1.8x or 2.5x Barlow
Plossl 32mm or 40mm
Plossl 55mm with eyeguard\$184
Wide field 40mm
Wide field 24mm\$124
Nagler 20mm
Nagler 16mm
Nagler 12mm or 13mm
Nagler 11mm
Nagler 9mm
Nagler 7mm
Nagler 4 8mm \$12

Since 1914

National Camera Exchange

9300 Olson Memerial Highway, Golden Valley, Minnesota 55427 For information, call the telescope experts at (612) 546-6831

TO ORDER CALL TOLL-FREE 1-800-624-8107